INSTALLATION INSTRUCTIONS

CE 0088

for the

Console Mounted Whip-style Delivery Unit

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Owner's Product Identification

(Information that you will need to provide for servicing - key information is highlighted)

Date of Purchase	***Serial Number***
Name of Owner / Facility / Department	***Model Number***
Name of Authorized Knight Dealer	Telephone # of Authorized Knight Dealer
Address of Authorized Knight Dealer	

IMPORTANT INFORMATION

Intended Use of Product

This product is intended to be used as a delivery system for doctor and assistant instrumentation during general dentistry examinations and procedures conducted by qualified dental professionals.

Authorized CE Representative

For countries in the CE union, any questions, incidents, or complaints must be directed to Midmark's Authorized CE representative listed below:

Promotal
22, Rue de St. Denis
53500 Ernee
France

Phone: 33-2-430-517-76
Fax: 33-2-430-569-10

Transportation / Storage Conditions

- Ambient Temperature Range ..... -22° to 140° F (-30° to 60°C)
- Relative Humidity ..... 10% to 90% (non-condensing)
- Atmospheric Pressure ..... 500hPa to 1060hPa (0.49atm to 1.05atm)

INSTALLATION INSTRUCTIONS
for the
Console Mounted
Whip-style Delivery Unit

SECTION I - REQUIREMENTS

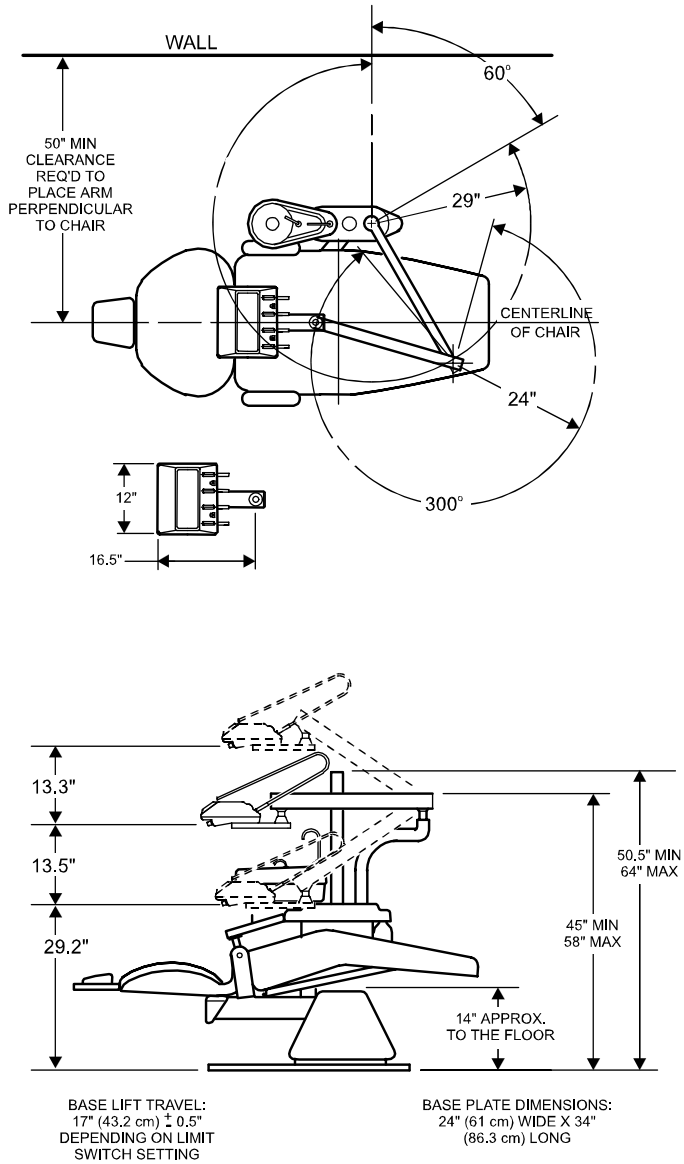

Figure 1

1. PHYSICAL REQUIREMENTS:

Before installing, ensure that the physical requirements of the unit are met (See Figure 1).

2. ELECTRICAL REQUIREMENTS:

Before connecting the line cord to an appropriate receptacle, make certain that the circuit is protected by a 15-amp circuit breaker for 120-VAC models, or a 7.5-amp breaker for 240-VAC models. Ensure that all wiring is grounded and all electrical codes are observed.

WARNING - Potential shock hazard with possible personal injury. To reduce shock hazard, observe all electrical codes.

3. WATER SUPPLY REQUIREMENTS:

A 1/2 I.D. copper supply line, reduced to 3/8" O.D. copper tubing as near the shut-off valve as possible is required. The water pressure should be in the range of 30-50 psi. A suitable pressure reducing valve is essential for trouble free operation if the pressure exceeds the recommended range.

4. AIR SUPPLY REQUIREMENTS:

A 1/2" I.D. copper supply line reduced to 3/8" O.D. copper tubing as near the shut-off valve as possible is required.

The air pressure must be between 75-100 psi at the valves. A pressure reducer should be installed if the pressure exceeds 100 psi.

For maximum life and trouble free operation, the air supply must be clean and dry. It is recommended that a moisture separator and filter be installed as near the connection as possible and accessible for periodic cleaning.

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SECTION II - INSTALLATION

1. UNPACKING THE CARTONS:

The chair mounted unit is shipped in a carton containing the following items:

- Unit console
- International instrument head and arm
- Chair Mount
- Light Post (Optional)
- Optional equipment
- Small parts box
- Utilities connection box (J box), and installation instructions
- Installation instructions (this manual), and operator's manual

Check for signs of damage to the carton or to the contents. Make sure all items listed above are present. If there is any evidence of damage due to shipping or if any of the items are missing from the carton, notify the shipper at once. Be careful not to discard any small parts or instruction sheets with the packing material.

2. UTILITIES CONNECTION BOX (J BOX) INSTALLATION:

To install the J box use the installation instructions supplied with the connection box. These instructions contain important information needed for proper installation. They may also be used as a template to locate the utilities for connection. The installation of the utilities connection box should be performed by a qualified technician.

Please consider the following before beginning:

- The connection box can be installed anywhere in the room within the range of the 6 foot umbilical that will connect the box to the unit. Locate the box where the incoming service lines will not cause an obstruction.
- Air is the only service required unless a heated syringe or lighted handpieces are to be used.
- Waste, vacuum or water lines are not necessary unless separate devices requiring these services are to be used.
- The location of the incoming services on the installation plan are suggestions and can be altered to suit the situation.

3. ELECTRICAL CONNECTIONS TO THE CONNECTION BOX (J BOX)

Figure 2 shows the typical arrangement for the electrical connections. The Accessory Power Chassis (APC) will be present if you have accessories such as a light, fiber optics, etc. The APC allows you to make your connections to a module without complicated wiring procedures. Specialized accessories other than a light will have their own instruction sheet in addition to this installation instruction.

DANGER: Turn off all electrical power at the power source before making primary electrical connections.

RATING FOR 120 VOLT UNIT

KNIGHT by MIDMARK, Versailles, Ohio, USA		
120 VOLTS	50/60 HERTZ	AIR 80/100 PSI WATER 30/50 PSI
15 AMPS MAX TOTAL CONNECTED LOAD		
THIS EQUIPMENT IS RATED TYPE I, CLASS B		

RATING FOR 240 VOLT UNIT

KNIGHT by MIDMARK, Versailles, Ohio, USA		
240 VOLTS	50/60 HERTZ	AIR 80/100 PSI WATER 30/50 PSI
7.5 AMPS MAX TOTAL CONNECTED LOAD		
THIS EQUIPMENT IS RATED TYPE I, CLASS B		

CONFORMS TO UL STD. 544
CERTIFIED TO CAN/CSA - C22.2 NO. 125-M1984

CE

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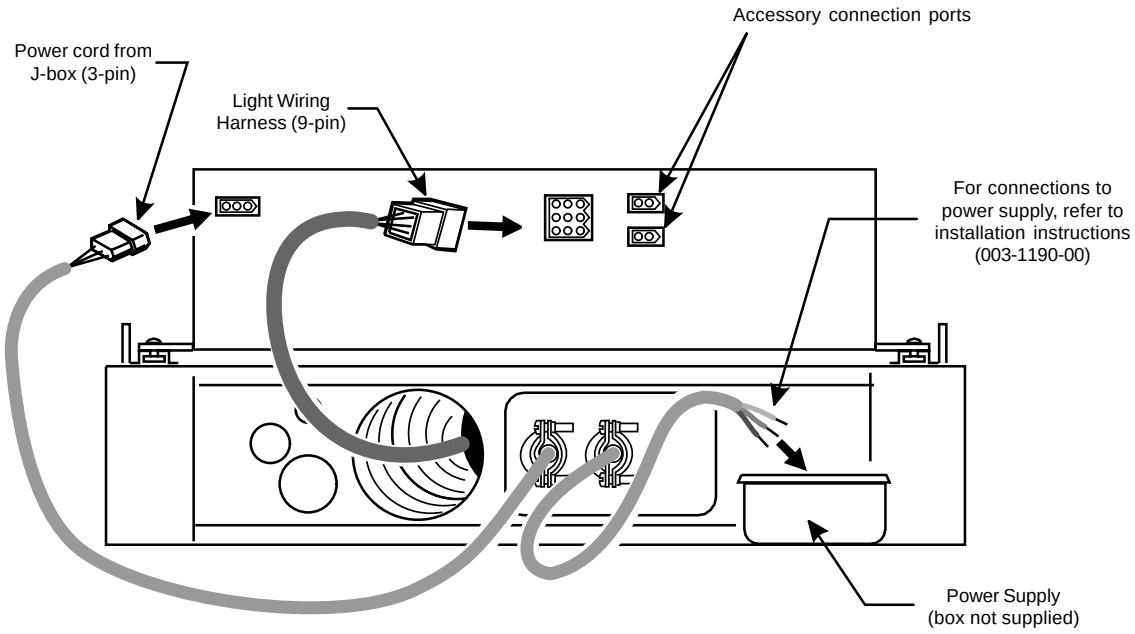
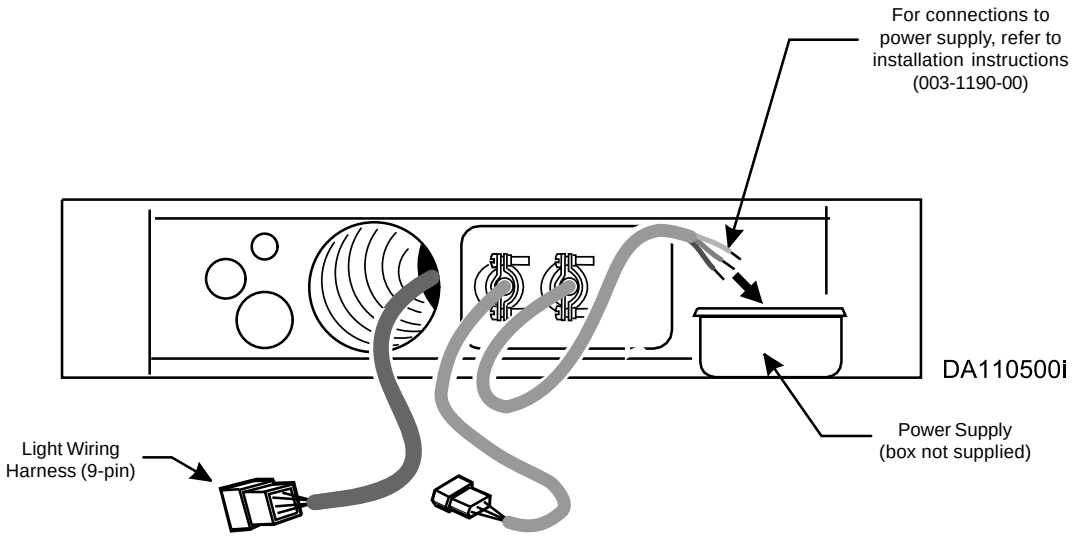
SECTION II - INSTALLATION


Accessory connection ports
Power cord from J-box (3-pin)
Light Wiring Harness (9-pin)
For connections to power supply, refer to installation instructions (003-1190-00)
Power Supply (box not supplied)

Electrical Connections in J-Box for Units with Accessory Power Chassis (APC)


For connections to power supply, refer to installation instructions (003-1190-00)
DA110500i
Power Supply (box not supplied)
Light Wiring Harness (9-pin)

Electrical Connections in J-Box for Units without Accessory Power Chassis (APC)

Figure 2

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SECTION II - INSTALLATION (CONT)

4. INSTALLING THE UNIT & CONSOLE:

Use the following procedure to mount the unit and console to the chair:

WARNING: Mounting this unit to some chairs may cause the chair to become unstable and increase the risk of tipping over. Please take steps to decrease the risk of tipping over by securing the chair to the floor or other mounting alternatives such as floor mounting the unit.

1. Remove both console covers by loosening two thumb screws on the underside of the console (See Figure 3).
2. Attach the mount to the chair using the two socket head screws provided. Tighten the screws securely.
3. Position the console onto the mount end and tighten the eight hex leveling bolts equally.

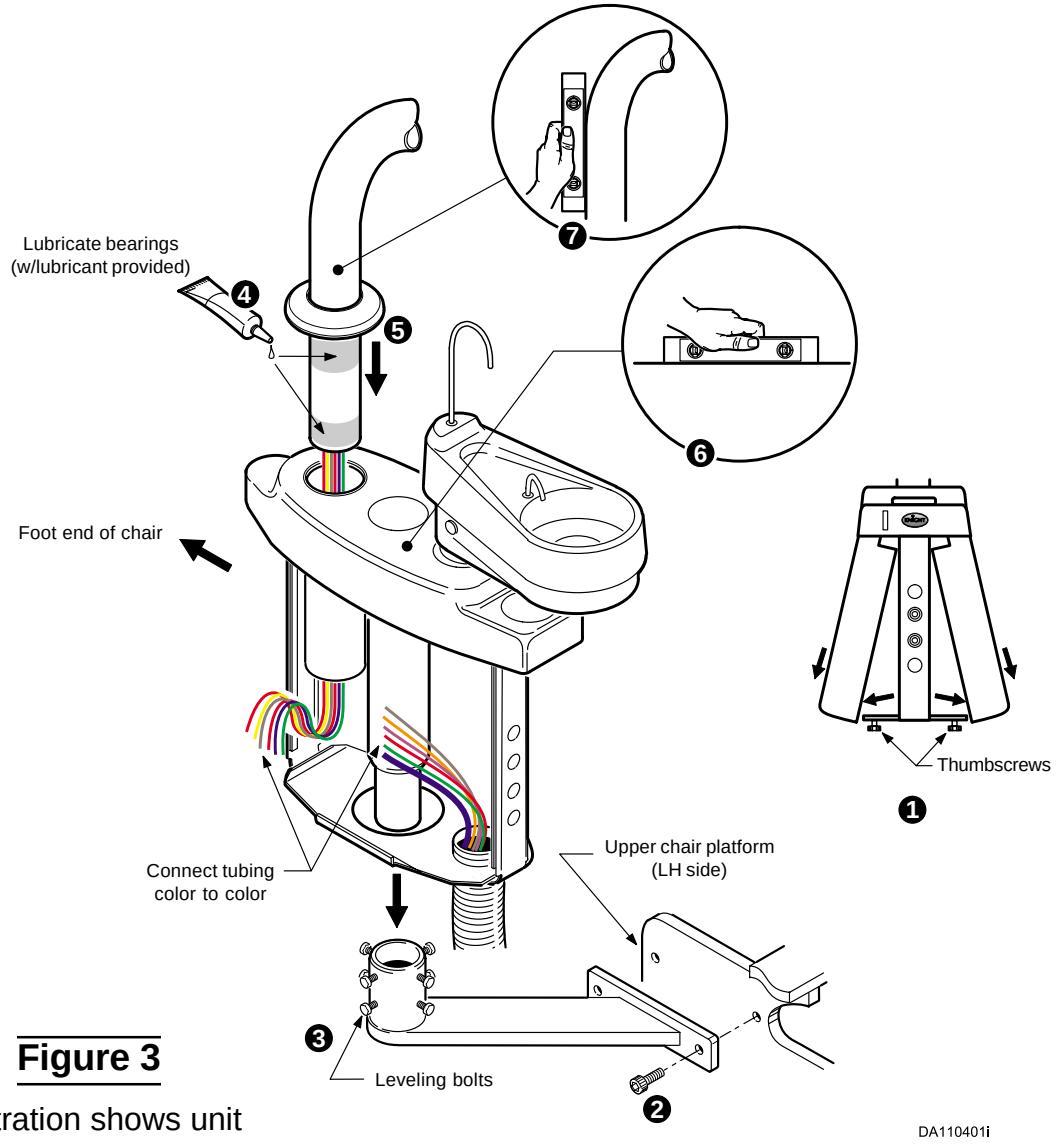

Figure 3

Illustration shows unit mounted on the left side of the chair for Right Hand operation

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SECTION II - INSTALLATION (CONT)

4. Locate the tube of lubricatant provided in the small parts box. Apply a few drops of lubricant to the unit arm in the areas that will make contact with the bearings in the console.
5. Mount the unit on the console by feeding the tubing from the unit down through the bearing in the console top.
6. Place a level on top of the console, loosen or tighten the eight hex bolts as needed to level the console. Be sure to check the level in two directions by moving the level 90 degrees.
7. Check the level of the unit arm and adjust the leveling hex bolts as necessary.
8. Carefully remove all packing material from the unit and read all information tags and labels.
9. **On 120 VAC Model** - An electrical box with a duplex outlet is provided on the console as a convenience.

   On 240 VAC Model - An electrical terminal box is provided for additional electrical connections.

DANGER: Turn off all electrical power at the power source before making primary electrical connections.

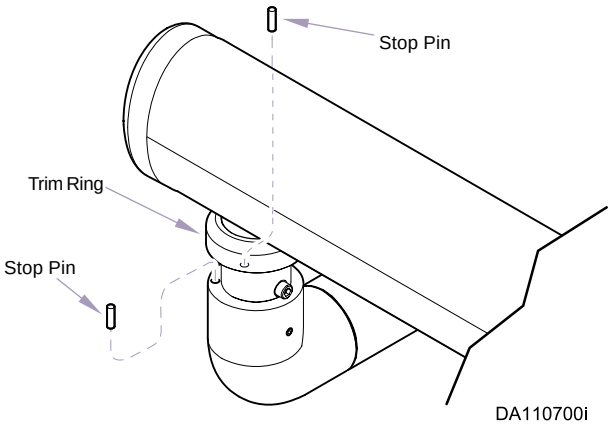

Figure 4

5. INSTALLING STOP ROTATION PINS:

Install the stop rotation pins on the unit arm as follows:

1. Slide the trim ring up (See Figure 4).
2. Install two stop pins.
3. Slide the trim ring down.

CAUTION: The rotation stop pins must be installed to prevent the arm being rotated completely around several times, which could damage internal tubing.

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SECTION II - INSTALLATION (CONT)

6. PREPARING THE FLEX ARM:

The flex arm has a built in locking mechanism controlled by a toggle switch located on the underside of the instrument head. Refer to Figure 5 and use the following procedure to prepare this feature for use:

1. Remove the end cap.
2. Slide the flex arm cover back to expose the interior of the flex arm.
3. Remove the wire tie which will release the lock pawl from the latch block.
4. Check the vertical movement of the flex arm. The flex arm tension is adjusted at the factory and should not require adjustment. However if adjustment is desired, simply tighten the tension nut to increase tension or loosen the tension nut to decrease tension.
5. Slide the flex arm cover into position taking care to position the bottom cover in its track.
6. Replace the end cap.

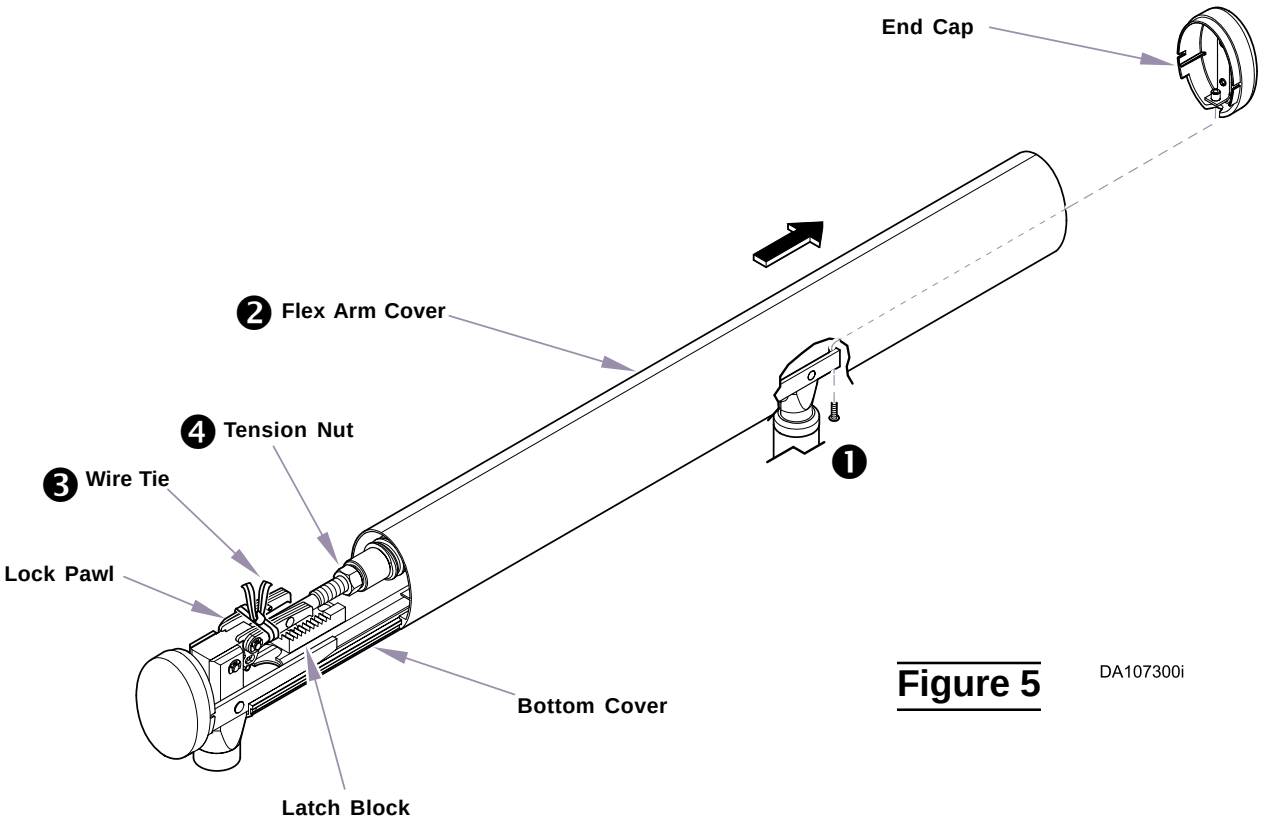

Figure 5 DA107300i

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SECTION II - INSTALLATION (CONT)

7. TUBING CONNECTIONS:

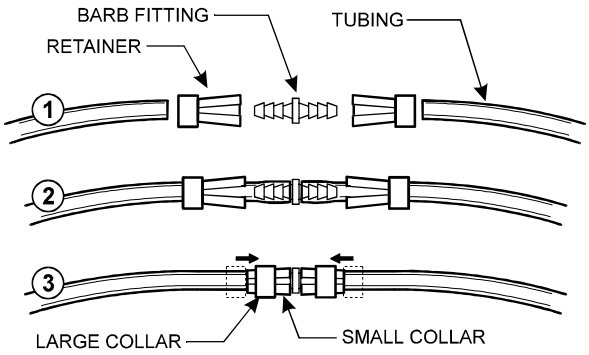
When connecting the umbilical tubings to the unit or other tubing, use the plastic retainers to secure the connection (Refer to Figure 6).

1/8" Tubing Connection

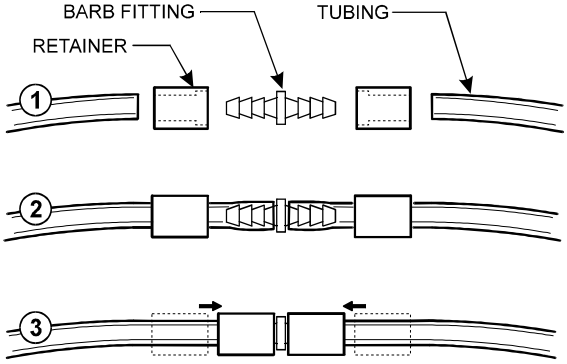
1. Slip the retainer (large end first) onto the tubing.
2. Push tubing onto the barb fitting and slide the retainer forward over the tubing on the barb fitting.
3. Break the large collar loose and slide it toward the fitting and over the small collar.

1/4" Tubing Connection

1. Slip the retainer onto the tubing with the large opening toward the end of the tubing.
2. Push the tubing onto the barb fitting.
3. Slide the retainer over the tubing on the barb fitting.



1/8" TUBING CONNECTION



1/4" TUBING CONNECTION

Figure 6

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SECTION II - INSTALLATION (CONT)

8. UMBILICAL TUBING CONNECTIONS TO THE UTILITIES CONNECTION BOX (J BOX):

Figure 7 shows the connections to be made inside the J box. Refer to installation instructions supplied with J-box. This plan may be used as a template to locate the utilities for connection. The installation should be performed by a qualified technician.

NOTE: Six feet of umbilical is provided. This may be shortened to suit the installation requirements or personal preference.

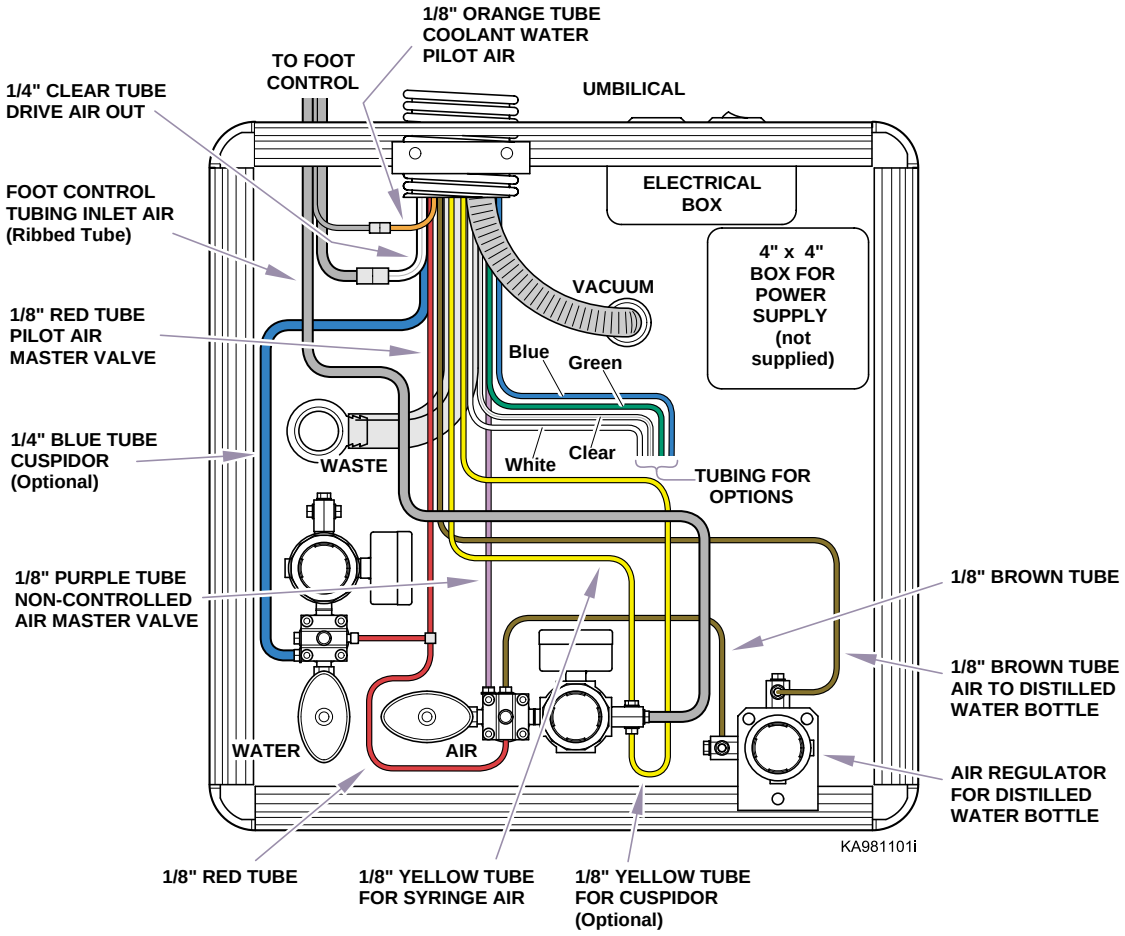

Figure 7

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SECTION III - CONTROLS

1. INTERNATIONAL HANDPIECE DELIVERY SYSTEM CONTROLS LOCATED ON THE LOWER FRONT OF THE INSTRUMENT HEAD:

A complete set of handpiece and syringe adjustments are located for convenient use on the lower front of the international instrument head. All controls are labeled with symbols identifying their function. A description follows and their locations are identified below.

I VISUAL ON/OFF INDICATOR
When the red indicator is visible, the main air and water are turned on and the unit is ready for operation.

2 HANDPIECE PRESSURE GAGE
This gage indicates individual handpiece pressure when the handpiece is operating.

3 MAIN ON/OFF SWITCH
This switch turns the main air and water on or off. This function is indicated by the visual on/off indicator (item # 1)

4 5 6 HANDPIECE COOLANT WATER VOLUME
These knobs adjust the amount of coolant water to the corresponding handpiece.

7 COOLANT WATER ON/OFF
This adjustment conveniently turns the water on or off to any handpiece without affecting the water volume setting and controls the volume of coolant delivered to each handpiece.

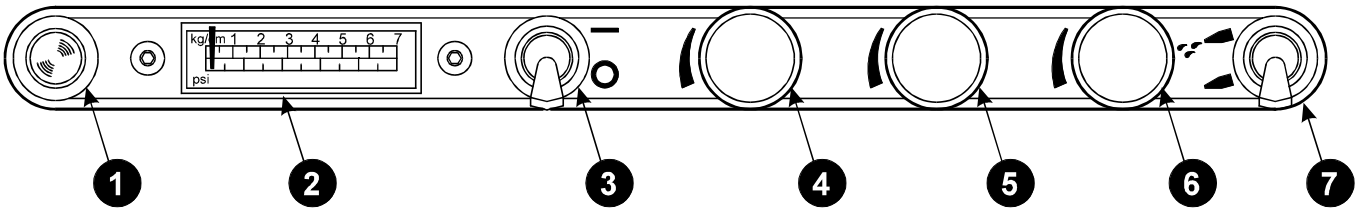

Figure 6

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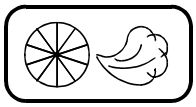
SECTION III - CONTROLS (CONT)

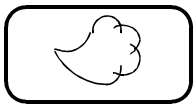
2. CONTROLS ON THE BOTTOM OF THE INSTRUMENT HEAD

These controls are provided to adjust the maximum handpiece operating pressure, coolant air spray pattern and syringe spray pattern (air and water volume). Adjust these controls to handpiece manufacturers specifications and/or personal preferences for the desired settings. All controls are labeled with symbols identifying their function as shown below.



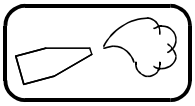
DRIVE AIR PRESSURE SETTING

An adjustment is provided for each handpiece. Use to set the maximum handpiece pressure indicated on the gage located on the lower front control panel. Refer to the manufacturer's handpiece specifications for the proper setting.



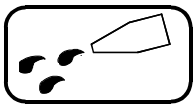
COOLANT AIR VOLUME ADJUSTMENT

This adjustment controls the volume of coolant air delivered to each handpiece and affects the spray pattern of air and water at the handpiece. If the handpiece has a coolant air connection itself, this adjustment may have no effect and can be completely shut off.



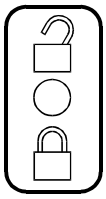
SYRINGE AIR VOLUME ADJUSTMENT

This adjustment controls the volume of air to the syringe and affects the air water spray pattern.



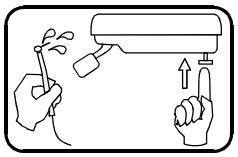
SYRINGE WATER VOLUME ADJUSTMENT

This adjustment controls the volume of water to the syringe and affects the water spray pattern.



ARM LOCK CONTROL

Located on the right side of the instrument head below the handle, this toggle switch control the locking mechanism in the unit flex arm.



HANDPIECE COOLANT WATER FLUSH BUTTON

This button controls the coolant water flush valve and is located on the left front underside of the delivery head.

3. OTHER CONTROLS AND INSTRUMENTS

WATER OUTLET AND FLOW CONTROL

Located on the front panel of the console, the water outlet provides water for hydrocolloid tubing or other accessories. The water is controlled by a flow control knob located next to the water outlet. Turning the knob clockwise will decreases water flow and counterclockwise increases the flow.

ASSISTANT'S INSTRUMENTATION

A saliva ejector, HVE and syringe are optional instrumentation on the unit. They are positioned on a movable holder that slides into the console or on the chair headrest.

WATER ON/OFF VALVE

Located on the foot control, this switch provides water for coolant spray to the handpiece when the switch is moved forward to the “On” position (toward blue dot) and the foot control is depressed (wet cutting). When the valve is in the “Off’ position, water will not be delivered to any handpiece.

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SECTION IV - OPERATIONAL CHECKS

When the installation is complete, certain operational checks should be made. These checks serve three important purposes; to make sure the equipment is functioning properly, to clear the tubing of any foreign material and to bleed the air out of the water tubing.

1. Before attaching the handpieces, turn on the air, water and vacuum to the utilities connection box.
2. Open the shut-off valves in the utilities connection box.
3. Turn on the master valve lever on the International head.
4. Turn the coolant water and coolant air volume control adjustment knobs, located on the lower front of the International head, completely open.
5. Lift a handpiece hose forward from its resting position on the molded handpiece pad.
6. Depress the foot control to operate the coolant water and drive air for 30 seconds.
7. Depress the coolant water flush button on the underside of the International head to allow the water to flow for 30 seconds
8. Repeat this procedure with each handpiece hose.
9. Install the handpieces.
10. Set the coolant water and coolant air volume controls to the desired position.

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SECTION IV - FINAL CHECK LIST

When all the assembly and installation procedures are completed, the unit should be checked out in accordance with the following check list to ensure that assembly is complete and that all controls function properly.

☐ Check complete system for any air or water leaks.

☐ Check to make sure there is proper air and water flow to the handpieces.

☐ Check the International handpiece delivery system for proper function.

☐ Check the syringes for proper function and water flow.

☐ Make sure that the unit has been cleaned and that all dirt and fingerprints have been removed.

☐ Be sure the person who will operate the unit receives the Operator's Manual and any other appropriate information or instructions.

☐ If any optional equipment has been installed, make sure it is properly installed and functioning as intended.

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DECLARATION OF CONFORMITY

MIDMARK CORPORATION

Midmark Corporation declares that SW and S-21 Dental Units conforms to the applicable requirements of the Medical Device Directive 93/42/EEC, Annex V and VII.

Serial Numbers: UA1278, UW01032, UC0971, and UK0148 to present.

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TPW1768 Rev. C (12/00)

KA940600

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